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Patent Application

for:

METHOD AND APPARATUS FOR CELLULAR INSTANT MESSAGING

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CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. Section 119(e) of the following co-pending and commonly-assigned U.S. provisional patent application which is incorporated by reference herein:

- 5 Provisional Application Serial No. 60/160,116, filed October 18, 1999, by David W. Kelleher, entitled "METHOD AND APPARATUS FOR CELLULAR INSTANT MESSAGING," attorneys' docket number 139.0142-US-P1.

BACKGROUND OF THE INVENTION

- 10 1. Field of the Invention.

The present invention relates generally to a cellular phone system, and in particular, a method and apparatus for cellular instant messaging.

2. Description of the Related Art.

- 15 Instant messaging is a popular application in use today on the Internet. In instant messaging, a program informs users when any individuals in their list of "buddies" (colleagues, workgroup members, friends, etc.) log onto the network so they can chat. Instant messaging software also notifies a user if a "buddy" sends them a message. A "chat" is the capability to conference with one or more users on a local network (LAN), on the
20 Internet or via a BBS (bulletin board system). The chat is accomplished by typing on the keyboard, not speaking, and each keystroke may be transmitted as it is pressed. Instant

messaging service requires that an instant messenger application be resident on a user's computer and the user must have Internet access through an Internet service provider.

The instant messaging application serves two purposes, first it provides a mechanism for the user to be notified when friends (or "buddies") the user has pre-designated have
5 logged onto the Internet. Second, the application serves as a communications tool whereby users on the list can send and receive text messages.

America Online (AOL) is the main provider of Instant messaging on the Internet and has enjoyed a very successful product. The popularity of instant messaging has begun to bring competitors to the market. For example, Yahoo and Microsoft (MSN) now offer a
10 similar service.

Extending instant messaging to a wireless environment is a valuable service. The prior art does not provide the ability to inform a user when another "buddy" on a cellular phone has turned on his/her cellular phone, when another "buddy" has logged onto a computer network.
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SUMMARY OF THE INVENTION

To overcome the limitations in the prior art described above, and to overcome other limitations that will become apparent upon reading and understanding the present specification, the present invention discloses a method that involves the melding of cellular
20 systems, pre-WAP (wireless application protocol) gateway architecture, telemetry services, handset functionality, and Internet messaging protocols to deliver cellular instant messaging.

The present invention provides a method and apparatus for cellular instant messaging. The present invention incorporates cellular telemetry into a digital cellular phone and utilizes the cellular telemetry to detect when a cellular customer has logged onto the cellular network or logged off of the cellular network. Upon logging onto the network or leaving the network, a telemetry message is generated and the present invention utilizes this telemetry message to update an instant messaging database and to refresh buddy/friends lists on PCs connected to the Internet and on cellular phones. The present invention uses voice, data, and SMS services to allow customers to exchange messages with their pre-designated community of friends, or to place a telephone call to a friend within their pre-designated community.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings in which like reference numbers represent corresponding parts throughout:

FIG. 1 illustrates a phone system 100 in accordance with one or more embodiments of the invention; and

FIG. 2 is a flow chart illustrating an instant messaging system in accordance with one or more embodiments of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following description, reference is made to the accompanying drawings which form a part hereof, and which is shown, by way of illustration, an embodiment of the present invention. It is understood that other embodiments may be utilized and structural changes may be made without departing from the scope of the present invention.

FIG. 1 illustrates a phone system 100 in accordance with one or more embodiments of the invention. Within a cellular phone system 100, a service area is divided into cells, each of which has the necessary equipment to switch, transmit, and receive calls to/from any cellular phone 102 located in the cell. A transceiver in each cell can transmit and receive a plurality of FM channels in a specified frequency range simultaneously.

A cellular phone 102 consists of a control unit, a transceiver, and appropriate antennas. The transceiver contains circuits that can tune to any of the channels assigned to the cellular phone system 100. Each cellular phone 102 has a unique electronic serial number (ESN). Additionally, each cellular phone 102 is assigned a 10-digit mobile identification number (MIN) identical in form to any other telephone number.

Users of the cellular phone 102 dial the local or long-distance number where applicable, as if calling from a fixed telephone. The cellular customer is typically charged a monthly connect charge as well as air-time usage charges for either incoming or outgoing calls.

The cellular phones 102 are interconnected and controlled by a central Mobile Telecommunications Switching Office (MTSO) across a signaling system 7 (SS7) network 106. The MTSO is basically a telephone switching office as far as hardware is concerned, but

includes a substantial amount of additional digital equipment programmed for cellular control.

The MTSO not only connects the system 100 to the land telephone network (the SS7 network 106), but also records call information for billing purposes. SS7 is the protocol used in the public switched telephone system for setting up calls and providing services. SS7 sets up and
5 tears down the call, handles all of the routing decisions, and supports all modern telephony services such as 800 numbers, call forwarding, caller ID, and local number portability (LNP).

A cellular network 104 provides cellular service in a particular region or area and may include one or more MTSOs to provide the cellular service. A cellular phone 102 is associated with a particular cellular network 104 as a home location/area. When a cellular
10 phone 102 is taken outside of the home location or into another cellular network 104 area, the cellular phone 102 is "roaming". The interim standard-41 (IS-41) is the protocol for passing cellular subscriber information from one carrier/cellular network 104 to another to provide roaming capabilities. Accordingly, IS-41 allows mobile travelers to roam across the country.

15 A message must be sent from a cellular phone 102 to the phone's 102 serving home location register before service is allowed when roaming. Such a message registers the phone in the foreign cellular network 104. When the cellular phone 102 is taken into a foreign cellular network 104, a message is transmitted to an MTSO in the foreign network 104. The foreign network 104 recognizes that the cellular phone 102 is from a different
20 network and requests validation of the phone's 102 service from the phone's 102 home

cellular network 104. Once validated, the cellular phone 102 is permitted to make and receive calls while in the foreign network 102.

Various methods of transmitting and various types of telemetry messages may leverage the IS-41 protocol and SS7 network to provide the instant messaging in accordance with embodiments of the invention. A telemetry message such as a registration notification message or remote feature activation message may be utilized to indicate a cellular phone's 102 availability for instant messaging on a cellular network 104. When a cellular phone 102 moves to a different cellular network 104 or powers on or off the cellular phone 102, a telemetry message is delivered to the appropriate cellular network 102. Once a cellular network 104 receives a telemetry message, the message can be forwarded, reformatted, or generally acted upon in some manner.

In order to incorporate this telemetry messaging capability into an instant messaging product, one or more embodiments of the invention use a cellular phone 102 where the software is modified to have the phone initiate two messages (e.g., registration messages) upon powering up and two messages (e.g., de-registration messages) when powering down. The first message is a telemetry message (e.g., a registration message or remote feature activation message as described below) that appends the actual cellular mobile phone 102 number and a power on indicator. The second message is a standard registration/activation sequence with the cellular system 104. The power down sequence is similar except a power down indicator is added to the telemetry message.

One or more embodiments of the invention may transmit a registration notification telemetry message, available from Cellemetry, LLC. With such a message, when a roaming cellular phone 102 recognizes the fact that it is not in its home network 104, the roaming cellular phone 102 sends a registration notification message containing the phone's 102 MIN and ESN to register for the foreign cellular network 104 via a control channel. The foreign cellular system 104 recognizes the roamer number and routes the MIN and ESN to the roamer's home system 104 for validation. Depending on the cellular network's 104 preferences, such a registration notification message may be required as often as each call or as infrequently as once a day.

10 In another method available from Aeris.net, a remote feature activation telemetry message is transmitted. A remote feature activation message comprises data encoded in a field (e.g., a dialed digits field) of a message. With the remote feature activation message, a fictitious area code (e.g., 175) is programmed into a cellular phone/radio 102. When attempting to send data, the fictitious area code is preceded by the star character (*) (e.g.,
15 *175). This combination identifies to the cellular system that the customer desires to activate or deactivate a feature (e.g., call forwarding, call waiting, etc.). Since a fictitious area code is used (i.e., an area code other than the cellular network's 104 area code), the cellular network 104 interprets the cellular phone 102 as a roaming cellular phone 102 desiring to activate/deactivate a feature and routes the message (*XX175 followed by data) over the SS7
20 network 106 to the cellular phone's 102 home cellular network 104/ location register. The home cellular network 104 is identified by the area code. Accordingly, an independently

maintained system 104, at the specified area code, that provides added instant messaging functionality (as described below) is forwarded the telemetry message. By leveraging the fact that a request has to go to the serving home cellular network 104, data (e.g., meter reading, location, event, etc.) may be added into the telemetry message.

5 While messages are being transmitted to and from cellular phone 102, a unique message is sent from the foreign cellular network 104 to a telemetry partner's 108 home location register (HLR) (e.g., in the area code or home cellular network 104 specified by the telemetry message) that contains information that the cellular customer has powered on/off or is in a particular cellular network 104 and the cellular phone number of that customer.

10 The message is forwarded to an instant messaging database 112, either maintained by a service provider, such as AirTouch, or with an instant messaging partner 110, such as America OnLine, MSN, or Yahoo. The instant messaging database 112 maintains the customer's profile (e.g., phone number, name, list of friends to include in the buddy/friend list, etc.).

15 The database 112 (through an instant messaging partner 110 if utilized) is provided to a server that interfaces with a network such as the Internet 114. The server also formats messages that may be delivered across the Internet 114 to update a PC 116 instant messaging application.

 The server sends, at the same time, a browser alert to a service provider's server
20 complex 118. The server complex 118 comprises various components such as the UP.Link Server 120 available from Phone.com. Further, the server complex 118 may comprise a

WAP (wireless application protocol) gateway or SMTP (simple mail transfer protocol) gateway 122. Such a WAP protocol or gateway 122 may comprise a standard protocol that provides cellular phones 102, pagers, and other handheld devices with secure access to e-mail and text-based web pages.

5 The sever complex 118 may also include one or more short message service centers (SMSCs) 124. With an SMSC, cellular phone 102 users can use the cellular phone's 102 digital handsets to send and receive short messages such as text messages of up to 160 characters (in a global system for mobility (GSM) network) or more (in code division multiple access (CDMA) and time division multiple access (TDMA) networks). In
10 accordance with one or more embodiments of the invention, the SMSCs 124 are utilized to send a browser alert to cellular phones 102 of cellular customers contained in a user's buddy/friend list. Using components 104-124, the invention is able to determine whether anyone on the user's buddy list is "active" or has their phone turned on. Accordingly, a cellular phone user 102 is notified when someone on the user's buddy list has turned on (or
15 off) their cellular phone 102. Thereafter, the cellular phone user 102 can act upon the awareness of their friend's status to either send a text message utilizing data or a short message service (SMS), or call their friends who now have their phones on.

FIG. 2 is a flow chart illustrating an instant messaging system in accordance with one or more embodiments of the invention. At step 202, a user turns on or off a cellular phone
20 102 (referred to as the current user/cellular phone 102). At step 204, telemetry messages are transmitted from the cellular phone 102 as part of the power-up/power-down sequence. As

described above, such a telemetry message identifies the cellular phone 102 and the power or availability status of the cellular phone 102. Thus, the telemetry messages indicate the availability of the cellular phone 102 on a cellular network 104.

At step 206, information is stored in an instant messaging database 112. Such
5 information may include the cellular phone 102 number as well as whether the cellular phone 102 has been turned on or off. Since the instant messaging database 112 maintains information regarding cellular phones 102 and buddy lists, the database 112 may be utilized to determine the buddy lists that include the current cellular phone 102 as a buddy. At step 208, a browser alert is transmitted to the cellular phones 102 that have the current cellular
10 phone 102 as a buddy. Additionally, if the current cellular phone 102 is being turned on/registered, the buddy list of the current cellular phone 102 may be examined. Thereafter, a browser alert is transmitted to the current cellular phone 102 that identifies those buddies that are available on the cellular network 104 (e.g., have their cellular phones 102 turned on).

At step 210, the current cellular phone 102 user determines if any buddies on the
15 user's buddy list are available. Thereafter, the user may transmit messages using an SMS 124 at step 212 or may call the buddy at step 214.

Conclusion

This concludes the description of one or more embodiments of the invention. One
20 or more embodiments of the invention provide the ability for cellular phone 102 users to transmit instant messages to other cellular phones 102 or to a PC 116. When a cellular

phone 102 is powered on or off a sequence of messages are transmitted wherein other cellular phones 102 or computers 116 (that contain the current cellular phone 102 on a buddy list) are notified of the power status. Additionally, the cellular phone 102 is notified of the status (e.g., online or powered on) of buddies on its buddy list.

- 5 The foregoing description of one or more embodiments of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not by this detailed description, but rather by the claims appended hereto.